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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XE297

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Pier Construction and Support Facilities Project, Port Angeles, WA

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that we have issued an incidental harassment authorization (IHA) to the U.S. Navy (Navy) to incidentally harass marine mammals during construction activities associated with the Pier Construction and Support Facilities Project at Port Angeles, WA.

DATES: This authorization is effective from November 1, 2016 to October 31, 2017.

FOR FURTHER INFORMATION CONTACT: Laura McCue, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of the Navy's application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet

at: www.nmfs.noaa.gov/pr/permits/incidental.htm. A memorandum describing our adoption of the Navy's Environmental Assessment (2016) and our associated Finding of No Significant Impact, prepared pursuant to the National Environmental Policy Act, are also available at the same site. In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified area, the incidental, but not intentional, taking of small numbers of marine mammals, providing that certain findings are made and the necessary prescriptions are established.

The incidental taking of small numbers of marine mammals may be allowed only if NMFS (through authority delegated by the Secretary) finds that the total taking by the specified activity during the specified time period will (i) have a negligible impact on the species or stock(s) and (ii) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). Further, the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking must be set forth, either in specific regulations or in an authorization.

The allowance of such incidental taking under section 101(a)(5)(A), by harassment, serious injury, death, or a combination thereof, requires that regulations be established. Subsequently, a Letter of Authorization may be issued pursuant to the

prescriptions established in such regulations, providing that the level of taking will be consistent with the findings made for the total taking allowable under the specific regulations. Under section 101(a)(5)(D), NMFS may authorize such incidental taking by harassment only, for periods of not more than one year, pursuant to requirements and conditions contained within an IHA. The establishment of prescriptions through either specific regulations or an authorization requires notice and opportunity for public comment.

NMFS has defined “negligible impact” in 50 CFR 216.103 as “...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: “...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.” The former is termed Level A harassment and the latter is termed Level B harassment.

Summary of Request

On September 11, 2015, we received a request from the Navy for authorization to take marine mammals incidental to pile driving associated with the construction of a pier and support facilities at the U.S. Coast Guard (USCG) Air Station/Sector Field Office Port Angeles (AIRSTA/SFO Port Angeles), located in Port Angeles Harbor on the Ediz

Hook peninsula, Port Angeles. The Navy submitted a revised version of the request on February 19, 2016, which we deemed adequate and complete on February 22, 2016.

The Navy will initiate this multi-year project, lasting up to 18 months, involving impact and vibratory pile driving conducted within the approved in-water work windows. In water work is expected to begin on November 1, 2016 in order to minimize impacts to an Atlantic Salmon net pen farm located in close proximity to the project area. In water work will conclude on February 15, 2017, and begin again from July 16 to October 31, 2017. If in-water work will extend beyond the effective dates of the IHA, a second IHA application will be submitted by the Navy.

The use of both vibratory and impact pile driving is expected to produce underwater sound at levels that have the potential to result in behavioral harassment of marine mammals. Take, by Level B Harassment, may impact individuals of five species of marine mammals (harbor porpoise (*Phocoena phocoena*), harbor seal (*Phoca vitulina*), Northern elephant seal (*Mirounga angustirostris*), Steller sea lion (*Eumatopias jubatus*), and California sea lion (*Zalophus californianus*)). As the next paragraph explains, we have also determined based on the best available information that there also may be a small number of take by Level A Harassment of harbor seals.

On August 4, 2016, NMFS released its Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Guidance). This new guidance established new thresholds for predicting auditory injury, which equates to Level A harassment under the MMPA. In the August 4, 2016, Federal Register Notice (81 FR 51694), NMFS explained the approach it would take during a transition period,

wherein we balance the need to consider this new best available science with the fact that some applicants have already committed time and resources to the development of analyses based on our previous thresholds and have constraints that preclude the recalculation of take estimates, as well as consideration of where the action is in the agency's decision-making pipeline. In that Notice, we included a non-exhaustive list of factors that would inform the most appropriate approach for considering the new Guidance, including: the scope of effects; how far in the process the applicant has progressed; when the authorization is needed; the cost and complexity of the analysis; and the degree to which the guidance is expected to affect our analysis.

In this case, the Navy initially submitted a request for authorization on September 11, 2015, followed by an adequate and complete request determination on February 22, 2016. The Navy requires issuance of the authorization in order to ensure that this critical national security infrastructure project is able to meet its necessary start date. The Guidance indicates that there is a greater likelihood of auditory injury for Phocid pinnipeds (*i.e.*, harbor seals) and for high-frequency cetaceans (*i.e.*, harbor porpoise) than was considered in our notice of proposed authorization. In order to address this increased likelihood, we increased the shutdown zones required for harbor seals to 100 m and for harbor porpoise to 150 m. With these changes, and in addition to other required mitigation measures, the Navy has a robust monitoring and mitigation program that we believe is effective in minimizing impacts to the affected species or stocks.

In addition, to account for the potential that not all harbor seals may be observed, we authorize the taking by Level A harassment of one harbor seal per day of projected

construction activity. In this analysis, we considered the potential for small numbers of harbor seals to incur auditory injury and found that it would not impact our preliminary determinations. In summary, we have considered the new Guidance and believe that the likelihood of injury is adequately addressed in the analysis contained herein and appropriate protective measures are in place in the IHA.

Description of the Specified Activity

Overview

The Navy has increased security for in-transit Fleet Ballistic Missile Submarines (SSBNs) in inland marine waters of northern Washington by establishing a Transit Protection System (TPS) that relies on the use of multiple escort vessels. The purpose of the Pier and Support Facilities for TPS project is to provide a staging location for TPS vessels and crews that escort incoming and outgoing SSBNs between dive/surface points in the Strait of Juan de Fuca and Naval Base (NAVBASE) Kitsap Bangor.

Specific activities that can be expected to result in the incidental taking of marine mammals are limited to the driving of steel piles used for installation of the trestle/fixed pier/floating docks, and the removal of temporary indicator piles.

Vibratory pile driving is the preferred method for production piles and would be the initial starting point for each installation; however, impact pile driving methods may be necessary based on substrate conditions. Once a pile hits “refusal,” which is where hard solid or dense substrate (*e.g.*, gravel, boulders) prevents further pile movement by vibratory methods, impact pile driving is used to drive the pile to depth.

All piles will be driven with a vibratory hammer for their initial embedment depths, while select piles may be finished with an impact hammer for proofing, as necessary. There will be no concurrent pile driving or multiple hammers operating simultaneously. Proofing involves striking a driven pile with an impact hammer to verify that it provides the required load-bearing capacity, as indicated by the number of hammer blows per foot of pile advancement. Sound attenuation measures (*i.e.*, bubble curtain) would be used during all impact hammer operations.

Dates and Duration

Under the action, in-water construction is anticipated to begin in 2016 and require two in-water work window seasons. The allowable season for in-water work, including pile driving, at AIRSTA/SFO Port Angeles is November 1, 2016 through February 15, 2017, and July 16, 2017 through October 31, 2017, a window established by the Washington Department of Fish and Wildlife in coordination with NMFS and the U.S. Fish and Wildlife Service (USFWS) to protect juvenile salmon (*Oncorhynchus spp.*) and bull trout (*Salvelinus confluentus*). Overall, a maximum of 75 days of pile driving are anticipated within these in-water work windows. All in-water construction activities will occur during daylight hours (sunrise to sunset) except from July 16 to September 23 when impact pile driving/removal will only occur starting 2 hours after sunrise and ending 2 hours before sunset, to protect foraging marbled murrelets (an Endangered Species Act (ESA)-listed bird under the jurisdiction of USFWS) during nesting season (April 1 - September 23). Other construction (not in-water) may occur between 7 a.m. and 10 p.m., year-round.

Specific Geographic Region

AIRSTA/SFO Port Angeles is located in the Strait of Juan de Fuca, approximately 62 miles (100 km) east of Cape Flattery, and 63 miles (102 km) northwest of Seattle, Washington on the Olympic Peninsula (see Figure 1-1 in the Navy's application). The Strait of Juan de Fuca is a wide waterway stretching from the Pacific Ocean to the Salish Sea. The strait is 95 miles (153 km) long, 15.5 miles (25 km) wide, and has depths ranging from 180 m to 250 m on the pacific coast and 55 m at the sill. Please see Section 2 of the Navy's application for detailed information about the specific geographic region, including physical and oceanographic characteristics.

Detailed Description of Activities

The purpose of the Pier and Support Facilities for TPS project (the project) is to provide a staging location for TPS vessels and crews that escort incoming and outgoing SSBNs between dive/surface points in the Strait of Juan de Fuca and Naval Base (NAVBASE) Kitsap Bangor. The Navy has increased security for in-transit Fleet Ballistic Missile Submarines (SSBNs) in inland marine waters of northern Washington by establishing a Transit Protection System (TPS) that relies on the use of multiple escort vessels. Construction of the pier and support facilities is grouped into three broad categories: 1) Site Work Activities 2) Construction of Upland Facilities (Alert Forces Facility (AFF) and Ready Service Armory (RSA)), and 3) Construction of Trestle/Fixed Pier/Floating Docks.

The trestle, fixed pier, and floating docks will result in a permanent increase in overwater coverage of 25,465 square feet (ft²) (2,366 square meters (m²)). An estimated

745 ft² (69 m²) of benthic seafloor will be displaced from the installation of the 144 permanent steel piles. The fixed pier will lie approximately 354 ft (108 m) offshore at water depths between -40 ft (-12 m) and -63 ft (19 m) mean lower low water (MLLW). It will be constructed of precast concrete and be approximately 160 feet long and 42 feet wide (49 m by 13 m). The fixed pier will have two mooring dolphins that connect to the fixed pier via a catwalk, and will be supported by 87 steel piles and result in 10,025 ft² (931 m²) of permanent overwater coverage. The floating docks including brows will be supported by 21 steel piles and result in 5,380 ft² (500 m²) of permanent overwater coverage. The trestle will provide vehicle and pedestrian access to the pier and convey utilities to the pier. It will be installed between +7 ft (2 m) MLLW and -45 ft (-14 m) MLLW. The trestle will be approximately 355 feet long (108 m) long and 24 feet (7 m) wide and constructed of precast concrete. The trestle will be designed to support a 50 pound per square foot (psf) (244 kilograms (kg) per square m) live load or a utility trailer with a total load of 3,000 pounds (1,360 kg), and will be supported by 36 steel piles and result in 10,060 ft² (935 m²) of permanent overwater coverage.

For the entire project, pile installation will include the installation and removal of 80 temporary indicator piles, installation of 60 permanent sheet piles, and installation of 144 permanent steel piles (Table 1). The indicator piles are required to determine if required bearing capacities will be achieved with the production piles, and to assess whether the correct vibratory and impact hammers are being used. The process will be to vibrate the piles to within 5 ft (1.5 m) of the target embedment depth required for the project, let the piles rest in place for a day, and then impact drive the piles the final 5 ft

(1.5 m). If the indicator piles cannot be successfully vibrated in, then a larger hammer will be used for the production piles. The impact driving will also provide an indication of bearing capacity via proofing. Each indicator pile would then be vibratory extracted (removed) using a vibratory hammer.

A maximum of 75 days of pile driving may occur. Table 1 summarizes the number and nature of piles required for the entire project.

Table 1. Summary of piles required for pier construction (in total)

Feature	Quantity and size
Total number of in-water piles	Up to 284*
Indicator temporary	24-in: 80
Sheet pile wall	PZC13 Steel sheet piles: 60
Trestle	18-in: 16 24-in: 12 36-in: 8
Fixed pier piles	24-in: 28 30-in: 49 36-in: 10
Floating docks	24-in: 3 30-in: 6 36-in: 12
Maximum pile driving duration	75 days (under one-year IHA)

*Pile installation would include the installation and removal of 80 temporary indicator piles, installation of 60 permanent sheet piles, and installation of 144 permanent steel piles

Pile installation will utilize vibratory pile drivers to the greatest extent possible, and the Navy anticipates that most piles will be able to be vibratory driven to within several feet of the required depth. Pile drivability is, to a large degree, a function of soil conditions and the type of pile hammer. Most piles should be able to be driven with a vibratory hammer to proper embedment depth. However, difficulties during pile driving may be encountered as a result of obstructions, such as rocks or boulders, which may exist throughout the project area. If difficult driving conditions occur, increased usage of an impact hammer will occur.

Pile production rates are dependent upon required embedment depths, the potential for encountering difficult driving conditions, and the ability to drive multiple piles without a need to relocate the driving rig. If difficult subsurface driving conditions (*e.g.*, cobble/boulder zones) are encountered that cause refusal with the vibratory equipment, it may be necessary to use an impact hammer to drive some piles for the remaining portion of their required depth. The worst-case scenario is that a pile would be driven for its entire length using an impact hammer. Given the uncertainty regarding the types and quantities of boulders or cobbles that may be encountered, and the depth at which they may be encountered, the number of strikes necessary to drive a pile its entire length would vary. All piles driven or struck with an impact hammer would be surrounded by a bubble curtain over the full water column to minimize in-water sound. Pile production rate (number of piles driven per day) is affected by many factors: size, type (vertical versus angled), and location of piles; weather; number of driver rigs operating; equipment reliability; geotechnical (subsurface) conditions; and work stoppages for security or environmental reasons (such as presence of marine mammals).

Comments and Responses

We published a notice of receipt of the Navy's application and proposed IHA in the **Federal Register** on April 4, 2016 (81 FR 19326). We received one comment, a letter from the Marine Mammal Commission concurring with NMFS's preliminary findings.

Comment: The Commission recommends the issuance of the IHA, subject to the inclusion of the proposed mitigation, monitoring, and reporting measures.

Response: We appreciate the Commission's concurrence with our findings and appreciate their input and support. We look forward to working with them on similar issues in the future.

Description of Marine Mammals in the Area of the Specified Activity

There are eleven marine mammal species with recorded occurrence in the Strait of Juan de Fuca (Table 2), including seven cetaceans and four pinnipeds. Of these eleven species, only five are expected to have a reasonable potential to be in the vicinity of the project site. These species are harbor porpoise (*Phocoena phocoena*), harbor seal (*Phoca vitulina*), Northern elephant seal (*Mirounga angustirostris*), Steller sea lion (*Eumatopias jubatus*), and California sea lion (*Zalophus californianus*). Harbor seals occur year round throughout the nearshore inland waters of Washington. Harbor seals are expected to occur year round in Port Angeles Harbor, with a nearby haul-out site on a log boom located approximately 1.7 miles (2.7 km) west of the project site and another haul-out site 1.3 miles (2.1 km) south of the project. Steller sea lions and California sea lions may occur in the area, but there are no site-specific surveys on these species. Harbor porpoises and Northern elephant seal are rare through the project area. The Dall's porpoise (*Phocoenoides dalli dalli*), humpback whale (*Megaptera novaeangliae*), minke whale (*Balaenoptera acutorostrata*), gray whale (*Eschrichtius robustus*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), and killer whales (*Orcinus orca*) are extremely rare in Port Angeles Harbor, and we do not believe there is a reasonable likelihood of their occurrence in the project area during the period of validity for this IHA.

We have reviewed the Navy’s detailed species descriptions, including life history information, for accuracy and completeness and refer the reader to Sections 3 and 4 of the Navy’s application instead of reprinting the information here. Please also refer to NMFS’ website (www.nmfs.noaa.gov/pr/species/mammals) for generalized species accounts and to the Navy’s Marine Resource Assessment for the Pacific Northwest, which documents and describes the marine resources that occur in Navy operating areas of the Pacific Northwest, including Strait of Juan de Fuca (DoN, 2006). The document is publicly available at www.navfac.navy.mil/products_and_services/ev/products_and_services/marine_resources/marine_resource_assessments.html (accessed February 1, 2016). We provided additional information for marine mammals with potential for occurrence in the area of the specified activity in our **Federal Register** notice of proposed authorization (April 4, 2016; 81 FR 19326).

Table 2. Marine mammals potentially present in the vicinity of AIRSTA/SFO Port Angeles

Species	Stock	ESA/MMPA status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR ³	Relative occurrence in Strait of Juan de Fuca; season of occurrence
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family Phocoenidae (porpoises)					
Harbor porpoise	Washington inland waters ⁵	-; N	10,682 (0.38; 7,841; 2003)	63	Possible regular presence in the Strait of Juan de Fuca, but unlikely near PAH; year-round
Dall’s porpoise	CA/OR/WA	-; N	42,000 (0.33; 32,106; 2008)	257	Rare
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family Delphinidae (dolphins)					

Pacific white-sided dolphin	CA/OR/WA	-; N	26,930 (0.28; 21,406; 2008)	171	Rare
Killer whale	West coast transient	-; N	243 (n/a; 243; 2009)	2.4	Unlikely
	Southern resident	E; S	78 (n/a; 78; 2014)	0.14	
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family Balaenopteridae					
Humpback whale	CA/OR/WA	E; S	1,918 (0.03; 1,855; 2011)	11	Unlikely
Minke whale	CA/OR/WA	-; N	478 (1.36; 202; 2008)	2	Unlikely
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family Eschrichtiidae					
Gray whale	Eastern N. Pacific	-; N	20,990 (0.05; 20,125; 2011)	624	Unlikely
Order Carnivora – Superfamily Pinnipedia					
Family Otariidae (eared seals and sea lions)					
California sea lion	U.S.	-; N	296,750 (n/a; 153,337; 2011)	9,200	Seasonal/common; Fall to late spring (Aug to Jun)
Steller sea lion	Eastern U.S.	-; S	60,131- 74,448 (n/a; 36,551; 2013) ⁶	1,645 ⁷	Seasonal/occasional; Fall to late spring (Sep to May)
Family Phocidae (earless seals)					
Harbor seal ⁸	Washington inland waters ⁵	-; N	11,036 (0.15; n/a; 1999)	n/a	Common; Year-round resident
Northern elephant seal	California breeding stock	-; N	179,000 (n/a; 81,368; 2010)	4,882	Seasonal/rare: Spring to late fall (Apr to Nov)

¹ESA status: Endangered (E), Threatened (T) / MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR (see footnote 3) or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

²CV is coefficient of variation; N_{\min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For certain stocks of pinnipeds, abundance estimates are based upon observations of animals (often pups) ashore multiplied by some correction factor derived from knowledge of the species' (or similar species') life history to arrive at a best abundance estimate; therefore, there is no associated CV. In these cases, the minimum abundance may represent actual counts of all animals ashore.

³Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).

⁴These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, subsistence hunting, ship strike). Annual M/SI often cannot be

determined precisely and is in some cases presented as a minimum value. All values presented here are from the draft 2015 SARs (www.nmfs.noaa.gov/pr/sars/draft.htm) except harbor seals. See comment 8.

⁵Abundance estimates for these stocks are greater than eight years old and are therefore not considered current. PBR is considered undetermined for these stocks, as there is no current minimum abundance estimate for use in calculation. We nevertheless present the most recent abundance estimates and PBR values, as these represent the best available information for use in this document.

⁶Best abundance is calculated as the product of pup counts and a factor based on the birth rate, sex and age structure, and growth rate of the population. A range is presented because the extrapolation factor varies depending on the vital rate parameter resulting in the growth rate (*i.e.*, high fecundity or low juvenile mortality).

⁷PBR is calculated for the U.S. portion of the stock only (excluding animals in British Columbia) and assumes that the stock is not within its OSP. If we assume that the stock is within its OSP, PBR for the U.S. portion increases to 2,069.

⁸Values for harbor seal presented here are from the 2013 SAR.

Potential Effects of the Specified Activity on Marine Mammals and their Habitat

Our **Federal Register** notice of proposed authorization (April 4, 2016; 81 FR 19326) provides a general background on sound relevant to the specified activity as well as a detailed description of marine mammal hearing and of the potential effects of these construction activities on marine mammals and their habitat.

Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses.

Measurements from similar pile driving events were coupled with practical spreading loss to estimate zones of influence (ZOI; see Estimated Take by Incidental Harassment); these values were used to develop mitigation measures for pile driving activities at Port Angeles harbor. The ZOIs effectively represent the mitigation zone that will be established around each pile to prevent Level A harassment to marine mammals,

while providing estimates of the areas within which Level B harassment might occur. In addition to the specific measures described later in this section, the Navy will conduct briefings between construction supervisors and crews, marine mammal monitoring team, and Navy staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

Mitigation Monitoring and Shutdown for Pile Driving

The following measures will apply to the Navy's mitigation through shutdown and disturbance zones:

Shutdown Zone – For all pile driving activities, the Navy will establish a shutdown zone intended to contain the area in which injury may occur. The purpose of a shutdown zone is to define an area within which shutdown of activity will occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area), thus preventing injury of marine mammals. During impact pile driving, the Navy will implement a minimum shutdown zone of 10 m radius for all marine mammals around all pile driving activity. Additionally, the Navy will implement a 100 m shutdown for harbor seals and a 150 m shutdown for harbor porpoises. These additional shutdown zones were added to prevent injury based off of NMFS's new acoustic guidance. During vibratory driving, the shutdown zone will be 10 m distance from the source for all animals. These precautionary measures are intended to further reduce any possibility of acoustic injury, as well as to account for any undue reduction in the modeled zones stemming from the

assumption of 8 dB attenuation from use of a bubble curtain (see discussion later in this section).

Disturbance Zone – Disturbance zones are the areas in which SPLs equal or exceed 160 and 120 dB rms (for pulsed and non-pulsed continuous sound, respectively). Disturbance zones provide utility for monitoring conducted for mitigation purposes (*i.e.*, shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area but outside the shutdown zone and thus prepare for potential shutdowns of activity. However, the primary purpose of disturbance zone monitoring is for documenting incidents of Level B harassment; disturbance zone monitoring is discussed in greater detail later (see *Monitoring and Reporting*). Nominal radial distances for disturbance zones are shown in Table 3. Given the size of the disturbance zone for vibratory pile driving, it is impossible to guarantee that all animals will be observed or to make comprehensive observations of fine-scale behavioral reactions to sound, and only a portion of the zone will be monitored.

In order to document observed incidents of harassment, monitors record all marine mammal observations, regardless of location. The observer's location, as well as the location of the pile being driven, is known from a GPS. The location of the animal is estimated as a distance from the observer, which is then compared to the location from the pile. The received level may be estimated on the basis of past or subsequent acoustic monitoring. It may then be determined whether the animal was exposed to sound levels constituting incidental harassment in post-processing of observational data, and a precise

accounting of observed incidents of harassment created. Therefore, although the predicted distances to behavioral harassment thresholds are useful for estimating harassment for purposes of authorizing levels of incidental take, actual take may be determined in part through the use of empirical data. That information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes.

Monitoring Protocols – Monitoring will be conducted before, during, and after pile driving activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven. Observations made outside the shutdown zone will not result in shutdown; that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point all pile driving activities will be halted. Monitoring will take place from fifteen minutes prior to initiation through thirty minutes post-completion of pile driving activities. Pile driving activities include the time to remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes. Please see the Marine Mammal Monitoring Plan (available at www.nmfs.noaa.gov/pr/permits/incidental.htm), developed by the Navy with our approval, for full details of the monitoring protocols.

The following additional measures apply to visual monitoring:

- (1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer

operator. Qualified observers are trained biologists, with the following minimum qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

(2) Prior to the start of pile driving activity, the shutdown zone will be monitored for fifteen minutes to ensure that it is clear of marine mammals. Pile driving

will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the shutdown zone (*i.e.*, must leave of their own volition) and their behavior will be monitored and documented. The shutdown zone may only be declared clear, and pile driving started, when the entire shutdown zone is visible (*i.e.*, when not obscured by dark, rain, fog, etc.). In addition, if such conditions should arise during impact pile driving that is already underway, the activity will be halted.

(3) If a marine mammal approaches or enters the shutdown zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or fifteen minutes have passed without re-detection of the animal. Monitoring will be conducted throughout the time required to drive a pile.

Sound Attenuation Devices

Sound levels can be greatly reduced during impact pile driving using sound attenuation devices. There are several types of sound attenuation devices including bubble curtains, cofferdams, and isolation casings (also called temporary noise attenuation piles (TNAP)), and cushion blocks. The Navy proposes to use bubble curtains, which create a column of air bubbles rising around a pile from the substrate to the water surface. The air bubbles absorb and scatter sound waves emanating from the pile, thereby reducing the sound energy. Bubble curtains may be confined or unconfined. The use of a confined or unconfined bubble curtain will be determined by the Navy's contractor based on the activity location's conditions; however, an unconfined bubble

curtain is the likely the design that will be used. Our **Federal Register** notice of proposed authorization (April 4, 2016; 81 FR 19326) provides a general background on bubble curtains.

To avoid loss of attenuation from design and implementation errors, the Navy has required specific bubble curtain design specifications, including testing requirements for air pressure and flow prior to initial impact hammer use, and a requirement for placement on the substrate. Bubble curtains shall be used during all impact pile driving. The device will distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column, and the lowest bubble ring shall be in contact with the mudline for the full circumference of the ring. We considered eight dB as potentially the best estimate of average SPL (rms) reduction, assuming appropriate deployment and no problems with the equipment. Therefore, an eight dB reduction was used in the Navy's analysis of pile driving noise in the environmental analyses.

Timing Restrictions

In Port Angeles Harbor, designated timing restrictions exist for pile driving activities to avoid in-water work when salmonids and other spawning forage fish are likely to be present. In-water work will be conducted between November 1, 2016-February 15, 2017, and July 16- October 31, 2017. All in-water construction activities will occur during daylight hours (sunrise to sunset) except from July 16 to September 23 when impact pile driving/removal will only occur starting 2 hours after sunrise and ending 2 hours before sunset, to protect foraging marbled murrelets during nesting season

(April 1 - September 23). Other construction (not in-water) may occur between 7 a.m. and 10 p.m., year-round.

Soft Start

The use of a soft-start procedure is believed to provide additional protection to marine mammals by warning or providing a chance to leave the area prior to the hammer operating at full capacity.

For impact driving, soft start will be required, and contractors will provide an initial set of strikes from the impact hammer at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy strike sets. The reduced energy of an individual hammer cannot be quantified because of variation in individual drivers. The actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in “bouncing” of the hammer as it strikes the pile, resulting in multiple “strikes.” Soft start for impact driving will be required at the beginning of each day’s pile driving work and at any time following a cessation of impact pile driving of thirty minutes or longer.

We have carefully evaluated the Navy’s proposed mitigation measures and considered their effectiveness in past implementation to determine whether they are likely to effect the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: (1) the manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals, (2) the proven or likely efficacy of the specific measure to

minimize adverse impacts as planned; and (3) the practicability of the measure for applicant implementation.

Any mitigation measure(s) we prescribe should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

(1) Avoidance or minimization of serious injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

(2) A reduction in the number (total number or number at biologically important time or location) of individual marine mammals exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(3) A reduction in the number (total number or number at biologically important time or location) of times any individual marine mammal would be exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(4) A reduction in the intensity of exposure to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing the severity of behavioral harassment only).

(5) Avoidance or minimization of adverse effects to marine mammal habitat, paying particular attention to the prey base, blockage or limitation of passage to or from biologically important areas, permanent destruction of habitat, or temporary disturbance of habitat during a biologically important time.

(6) For monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of the Navy's proposed measures, we have determined that the mitigation measures provide the means of effecting the least practicable impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth "requirements pertaining to the monitoring and reporting of such taking". The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for incidental take authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area.

Any monitoring requirement we prescribe should accomplish one or more of the following general goals:

1. An increase in the probability of detecting marine mammals, both within defined zones of effect (thus allowing for more effective implementation of the mitigation) and in general to generate more data to contribute to the analyses mentioned below;

2. An increase in our understanding of how many marine mammals are likely to be exposed to stimuli that we associate with specific adverse effects, such as behavioral harassment or hearing threshold shifts;

3. An increase in our understanding of how marine mammals respond to stimuli expected to result in incidental take and how anticipated adverse effects on individuals may impact the population, stock, or species (specifically through effects on annual rates of recruitment or survival) through any of the following methods:

- Behavioral observations in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict pertinent information, *e.g.*, received level, distance from source);
- Physiological measurements in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict pertinent information, *e.g.*, received level, distance from source);
- Distribution and/or abundance comparisons in times or areas with concentrated stimuli versus times or areas without stimuli;

4. An increased knowledge of the affected species; or

5. An increase in our understanding of the effectiveness of certain mitigation and monitoring measures.

The Navy submitted a marine mammal monitoring plan as part of the IHA application for this project. It can be found on the Internet at www.nmfs.noaa.gov/pr/permits/incidental.htm.

Visual Marine Mammal Observations

The Navy will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of activity. All observers will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. The Navy will monitor the shutdown zone and disturbance zone before, during, and after pile driving, with observers located at the best practicable vantage points. Based on our requirements, the Marine Mammal Monitoring Plan will implement the following procedures for pile driving:

- A minimum of three Marine Mammal Observers (protected species observers (PSOs)) will be present during both impact and vibratory pile driving/removal and would be located at the best vantage point(s) in order to properly see the entire shutdown zone and as much of the disturbance zone as possible.
- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals.
- If the shutdown zones are obscured by fog or poor lighting conditions, pile driving at that location will not be initiated until that zone is visible. Should such conditions arise while impact driving is underway, the activity will be halted.
- The shutdown and disturbance zones around the pile will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. Monitoring biologists will use their best professional

judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to protocol will be coordinated between NMFS and the Navy.

Data Collection

We require that observers use approved data forms. Among other pieces of information, the Navy will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. In addition, the Navy will attempt to distinguish between the number of individual animals taken and the number of incidents of take. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns,

including bearing and direction of travel and distance from pile driving activity;

- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting

A draft report will be submitted within ninety calendar days of the completion of the in-water work window or sixty days prior to the requested date of issuance of any future IHA for projects at the same location, whichever comes first.. The report will include marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and will also provide descriptions of any problems encountered in deploying sound attenuating devices, any behavioral responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and an extrapolated total take estimate based on the number of marine mammals observed during the course of construction. A final report must be submitted within thirty days following resolution of comments on the draft report.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: “...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).”

All anticipated takes would be by Level A and Level B harassment resulting from vibratory and impact pile driving and involving temporary changes in behavior (Level B) and permanent threshold shift (PTS) (Level A).

Low level responses to sound (*e.g.*, short-term avoidance of an area, short-term changes in locomotion or vocalization) are less likely to result in fitness effects on individuals that would ultimately affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individual animals could potentially be significant and could potentially translate to effects on annual rates of recruitment or survival (*e.g.*, Lusseau and Bejder, 2007; Weilgart, 2007). Specific understanding of the activity and the effected species are necessary to predict the severity of impacts and the likelihood of fitness impacts, however, we start with the estimated number of takes, understanding that additional analysis is needed to understand what those takes mean. Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound, taking the duration of the activity into consideration. This practice provides a good sense of the number of instances of take, but potentially overestimates the numbers of individual marine mammals taken. In particular, for stationary activities, it is more likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of residency or site fidelity and the impetus to use the site (*e.g.*, because of foraging opportunities) is stronger than the deterrence presented by the harassing activity.

The project area is not believed to be particularly important habitat for marine mammals, nor is it considered an area frequented by marine mammals. Therefore, behavioral disturbances and PTS that could result from anthropogenic sound associated with these activities are expected to affect only a relatively small number of individual marine mammals, although those effects could be recurring over the life of the project if the same individuals remain in the project vicinity.

The Navy has requested authorization for the incidental taking of small numbers of Steller sea lions, California sea lions, harbor seals, Northern elephant seals, and harbor porpoises in Port Angeles Harbor that may result from pile driving during construction activities associated with the pier construction and support facilities project. We described applicable sound thresholds for determining effects to marine mammals before describing the information used in estimating the sound fields, the available marine mammal density or abundance information, and the method of estimating potential incidents of take in detail in our **Federal Register** notice of proposed authorization (April 4, 2016; 81 FR 19326). All calculated distances to and the total area encompassed by the marine mammal sound thresholds are provided in Table 3. NMFS's new acoustic guidance established new thresholds for predicting auditory injury (Level A Harassment). The Guidance indicates that there is a greater likelihood of auditory injury for Phocid pinnipeds (*i.e.*, harbor seals) and for high-frequency cetaceans (*i.e.*, harbor porpoise) than was considered in our notice of proposed authorization. In order to address this increased likelihood, we increased the shutdown zones required for harbor seals to 100 m and for harbor porpoise to 150 m. In addition, to account for the potential that not all harbor seals

may be observed, we authorize the taking by Level A harassment of one harbor seal per day of projected construction activity.

Although radial distance and area associated with the zone ensonified to 160 dB (the behavioral harassment threshold for pulsed sounds, such as those produced by impact driving) are presented in Table 3, this zone would be subsumed by the 120-dB zone produced by vibratory driving. Thus, behavioral harassment of marine mammals associated with impact driving is not considered further here. Since the 160-dB threshold and the 120-dB threshold both indicate behavioral harassment, pile driving effects in the two zones are equivalent. Although not considered as a likely construction scenario, if only the impact driver was operated on a given day incidental take on that day would likely be lower because the area ensonified to levels producing Level B harassment would be smaller (although actual take would be determined by the numbers of marine mammals in the area on that day).

Table 3. Calculated distance(s) to and area encompassed by underwater marine mammal sound thresholds during pile installation

Threshold	Steel pile size	Distance	Area (km ²)
Impact driving, disturbance (160 dB)	24 inch	464 m	0.43
	30- inch	631 m	0.75
	36-inch	398 m	0.33
Vibratory driving, disturbance (120 dB)	24 inch	6,310 m	20.4
	30- inch	13,594 m	29.9
	36-inch	13,594 m	29.9

Port Angeles Harbor does not represent open water, or free field, conditions. Therefore, sounds would attenuate as they encounter land masses or bends in the canal. As a result, the calculated distance and areas of impact for the 120-dB threshold cannot actually be attained at the project area. See Figure 6-1 of the Navy's application for a depiction of the size of areas in which each underwater sound threshold is predicted to occur at the project area due to pile driving.

Marine Mammal Densities

The Navy has developed, with input from regional marine mammal experts, estimates of marine mammal densities in Washington inland waters for the Navy Marine Species Density Database (NMSDD). A technical report (Hanser *et al.*, 2015) describes methodologies and available information used to derive these densities, which are generally considered the best available information for Washington inland waters, except where specific local abundance information is available. Here, we rely on NMSDD density information for the Steller sea lions and California sea lions, and use local abundance data for harbor seals. For species without a predictable occurrence, like the harbor porpoise and Northern elephant seal, estimates are based on historical likelihood of encounter. Please see Appendix A of the Navy's application for more information on the NMSDD information.

For all species, the most appropriate information available was used to estimate the number of potential incidences of take. For harbor porpoise and Northern elephant seals, this involved reviewing historical occurrence and numbers, as well as group size to develop a realistic estimate of potential exposure. For Steller sea lion and California sea

lions, this involved NMSDD data. For harbor seals, this involved site-specific data from published literature describing harbor seal research conducted in Washington and Oregon, including counts from haul-outs near Port Angeles Harbor (WDFW, 2015). Therefore, density was calculated as the maximum number of individuals expected to be present at a given time (Houghton *et al.*, 2015) divided by the area of Port Angeles Harbor.

Description of Take Calculation

The take calculations presented here rely on the best data currently available for marine mammal populations in the Port Angeles Harbor. The formula was developed for calculating take due to pile driving activity and applied to each group-specific sound impact threshold. The formula is founded on the following assumptions:

- All marine mammal individuals potentially available are assumed to be present within the relevant area, and thus incidentally taken;
- An individual can only be taken once during a 24-h period;
- There were will be 75 total days of in-water activity and the largest ZOI equals 29.9 km²;
- Exposures to sound levels above the relevant thresholds equate to take, as defined by the MMPA.

The calculation for marine mammal takes is estimated by:

Exposure estimate = (n * ZOI) * days of total activity

where:

n = density estimate used for each species/season

ZOI = sound threshold ZOI area; the area encompassed by all locations where the SPLs equal or exceed the threshold being evaluated

$n * \text{ZOI}$ produces an estimate of the abundance of animals that could be present in the area for exposure, and is rounded to the nearest whole number before multiplying by days of total activity.

The ZOI impact area is the estimated range of impact to the sound criteria. The relevant distances specified in Table 3 were used to calculate ZOIs around each pile. The ZOI impact area took into consideration the possible affected area of Port Angeles harbor from the pile driving site furthest from shore with attenuation due to land shadowing from bends in the shoreline. Because of the close proximity of some of the piles to the shore, the narrowness of the harbor at the project area, and the maximum fetch, the ZOIs for each threshold are not necessarily spherical and may be truncated.

While pile driving can occur any day throughout the in-water work window, and the analysis is conducted on a per day basis, only a fraction of that time (typically a matter of hours on any given day) is actually spent pile driving. Acoustic monitoring has demonstrated that Level B harassment zones for vibratory pile driving are likely to be smaller than the zones estimated through modeling based on measured source levels and practical spreading loss. Also of note is the fact that the effectiveness of mitigation measures in reducing takes is typically not quantified in the take estimation process. See Table 4 for total estimated incidents of take.

Harbor Porpoise – In Washington inland waters, harbor porpoises are most abundant in the Strait of Juan de Fuca, San Juan Island area, and Admiralty Inlet.

Although harbor porpoise occur year round in the Strait of Juan de Fuca, harbor porpoises are a rare occurrence in Port Angeles Harbor, and density-based analysis does not adequately account for their unique temporal and spatial distributions. Estimates are based on historical likelihood of encounter. Based on the assumption that 3 harbor porpoise may be present intermittently in the ZOI (Hall, 2004), a total of 225 harbor porpoise exposures were estimated over 75 days of construction. These exposures would be a temporary behavioral harassment and would not impact the long-term health of individuals; the viability of the population, species, or stocks would remain stable.

California Sea Lion – The California sea lion is most common in the Strait of Juan de Fuca from fall to late spring. California sea lion haul-outs are greater than 30 miles (48 km) away. Animals could be exposed when traveling, resting, or foraging. Primarily only male California sea lions migrate through the Strait of Juan de Fuca (Jeffries *et al.*, 2000). Based on the NMSDD data showing that 0.676 California sea lions per km² may be present intermittently in the ZOI, 1,500 exposures were estimated for this species. These exposures would be a temporary behavioral harassment. It is assumed that this number would include multiple behavioral harassments of the same individual(s).

Steller Sea Lion — Steller sea lions occur seasonally in the Strait of Juan de Fuca from September through May. Steller sea lion haul-outs are 13 miles (21 km) away. Based on the NMSDD data showing that 0.935 Steller sea lion per km² may be present intermittently in the ZOI, 2,100 exposures were estimated for this species. These exposures would be a temporary behavioral harassment. It is assumed that this number would include multiple behavioral harassments of the same individual(s).

Harbor Seal – Harbor seals are present year round with haul-outs in Port Angeles Harbor. Prior Navy IHAs have successfully used density-based estimates; however, in this case, density estimates were not appropriate because there is a haul-out nearby on a log boom approximately 1.7 miles (2.7 km) west of the project site that was last surveyed in March 2013 and had a total count of 73 harbor seals (WDFW 2015). Another haul-out site is 1.3 miles (2.1 km) south of the project but is across the harbor that was last surveyed in July 2010 and had a total count of 87 harbor seals (WDFW 2015). Density was calculated as the maximum number of individuals expected to be present at a given time (160 animals), times the number of days of pile activity. Based on the assumption that there could be 160 harbors seals hauled out in proximity to the ZOI, 12,000 exposures were estimated for this stock over 75 days of construction. Additionally, to account for the potential that all harbor seals may not be observed in an area that may incur PTS, we authorize the taking by Level A harassment of one harbor seal per day of projected construction activity for a total of 75 Level A takes.

We recognize that over the course of the day, while the proportion of animals in the water may not vary significantly, different individuals may enter and exit the water. Therefore, an instantaneous estimate of animals in the water at a given time may not produce an accurate assessment of the number of individuals that enter the water over the daily duration of the activity. However, no data exist regarding fine-scale harbor seal movements within the project area on time durations of less than a day, thus precluding an assessment of ingress or egress of different animals through the action area. As such, it

is impossible, given available data, to determine exactly what number of individuals may potentially be exposed to underwater sound.

A typical pile driving day (in terms of the actual time spent driving) is somewhat shorter than may be assumed (*i.e.*, 8-15 hours) as a representative pile driving day based on daylight hours. Construction scheduling and notional production rates in concert with typical delays mean that hammers are active for only some fraction of time on pile driving “days.”

Harbor seals are not likely to have a uniform distribution as is assumed through use of a density estimate, but are likely to be relatively concentrated near areas of interest such as the haul-outs or foraging areas. The estimated 160 harbor seals is the maximum number of animals at haul-outs outside of the airborne Level B behavioral harassment zone; the number of exposures to individual harbor seals foraging in the underwater behavioral harassment zone would likely be much lower.

This tells us that (1) there are likely to be significantly fewer harbor seals in the majority of the action area than the take estimate suggests; and (2) pile driving actually occurs over a limited timeframe on any given day (*i.e.*, less total time per day than would be assumed based on daylight hours and non-continuously), reducing the amount of time over which new individuals might enter the action area within a given day. These factors lead us to believe that the approximate number of seals that may be found in the action area (160) is more representative of the number of animals exposed than the number of Level B Harassment takes requested for this species, and only represents 1.5 percent of the most recent estimate of this stock of harbor seals. Moreover, because the Navy is

typically unable to determine from field observations whether the same or different individuals are being exposed, each observation is recorded as a new take, although an individual theoretically would only be considered as taken once in a given day.

Northern elephant seal – Northern elephant seals are rare visitors to the Strait of Juan de Fuca. However, individuals, primarily juveniles, have been known to sporadically haul out to molt on Dungeness Spit about 12 miles (19 km) from Port Angeles. One elephant seal was observed hauled-out at Dungeness Spit in each of the following years: 2000, 2002, 2004, 2005, and 2006 (WDFW 2015). Elephant seals are primarily present during spring and summer months. If a northern elephant seal was in the ZOI, it would likely be a solitary juvenile. Northern elephant seals are a rare occurrence in Port Angeles Harbor, and density-based analysis does not adequately account for their unique temporal and spatial distributions; therefore, estimates are based on historical likelihood of encounter. Based on the assumption that one elephant seal may be present intermittently in the ZOI, 75 exposures were calculated for this species. These exposures would be a temporary behavioral harassment.

Table 4. Number of potential incidental instances of take of marine mammals within various acoustic threshold zones

Species	Density	Underwater		% of stock
		Level A	Level B (120 dB) ¹	
California sea lion	0.676 animal/sq. km*	0	1,500	0.5
Steller sea lion	0.935 animals/sq. km*	0	2,100	4
Harbor seal	160 ²	75	12,000/160 ⁴	100/1.5

Northern elephant seal	1 ³	0	75	0.04
Harbor porpoise	3 ³	0	225	2

¹The 160-dB acoustic harassment zone associated with impact pile driving would always be subsumed by the 120-dB harassment zone produced by vibratory driving. Therefore, takes are not calculated separately for the two zones.

^{*}For species with associated density, density was multiplied by largest ZOI (*i.e.*, 29.9 km²). The resulting value was rounded to the nearest whole number and multiplied by the 75 days of activity. For species with abundance only, that value was multiplied directly by the 75 days of activity. We assume for reasons described earlier that no takes would result from airborne noise.

²For this species, site-specific data was used from published literature describing research conducted in Washington and Oregon, including counts from haul-outs near Port Angeles Harbor. Therefore, density was calculated as the maximum number of individuals expected to be present at a given time.

³Figures presented are abundance numbers, not density, and are calculated as the average of average daily maximum numbers per month (see Section 6.6 in application). Abundance numbers are rounded to the nearest whole number for take estimation.

⁴The maximum number of harbor seal anticipated to be in the vicinity to be exposed to the sound levels is 160 animals based on counts from the two nearby haul out sites. This small number of individuals is expected to be the same animals exposed repeatedly, instead of new individuals being exposed each day. These animals, to which any incidental take would accrue, represent 1.5 percent of the most recent estimate of the stock abundance from the 2013 SAR.

Analyses and Preliminary Determinations

Negligible Impact Analysis

NMFS has defined “negligible impact” in 50 CFR 216.103 as “...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of Level A and Level B harassment takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through behavioral harassment, we consider other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or

location, migration), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, and effects on habitat. To avoid repetition, the discussion of our analyses applies to all the species listed in Table 4, given that the anticipated effects of this activity on these different marine mammal stocks are expected to be similar. There is no information about the nature or severity of the impacts, or the size, status, or structure of any of these species or stocks that would lead to a different analysis for this activity.

Pile driving activities associated with the pier construction project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level A (PTS) and Level B harassment (behavioral disturbance), from underwater sounds generated from pile driving. Potential takes could occur if individuals of these species are present in the ensonified zone when pile driving is happening, which is likely to occur because (1) harbor seals are frequently observed in Port Angeles harbor in two known haul-out locations; or (2) cetaceans or pinnipeds transit the outer edges of the larger Level B harassment zone outside of the harbor.

No serious injury or mortality is anticipated given the methods of installation and measures designed to minimize the possibility of serious injury to marine mammals. The potential for these outcomes is minimized through the construction method and the implementation of the planned mitigation measures. Specifically, vibratory hammers will be the primary method of installation, and this activity does not have significant potential to cause serious injury to marine mammals due to the relatively low source levels

produced and the lack of potentially injurious source characteristics. Impact pile driving produces short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks. When impact driving is necessary, required measures (use of a sound attenuation system, which reduces overall source levels as well as dampening the sharp, potentially injurious peaks, and implementation of shutdown zones) significantly reduce any possibility of serious injury. Given sufficient “notice” through use of soft start, marine mammals are expected to move away from a sound source that is annoying prior to it becoming potentially injurious. The likelihood that marine mammal detection ability by trained observers is high under the environmental conditions described for Port Angeles harbor further enables the implementation of shutdowns to avoid serious injury or mortality.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in disruption of foraging behavior. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness to those individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable impact

through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the project area while the activity is occurring.

Effects on individuals that are taken by Level A harassment would be in the form of PTS. In this analysis, we considered the potential for small numbers of harbor seals to incur auditory injury and found that it would not impact our determinations.

For pinnipeds, no rookeries are present in the project area, but there are two haul-outs within 2.5 mi (4 km) of the project site. However, the project area is not known to provide foraging habitat of any special importance (other than is afforded by the known migration of salmonids). No cetaceans are expected within the harbor.

In summary, this negligible impact analysis is founded on the following factors: (1) the possibility of serious injury or mortality may reasonably be considered discountable; (2) the anticipated incidences of Level B harassment consist of, at worst, temporary modifications in behavior and the anticipated incidences of Level A harassment would be in the form of PTS to a small number of only one species; (3) the absence of any major rookeries and only a few haul-out areas near or adjacent to the project site; (4) the absence of cetaceans within the harbor and generally sporadic occurrence outside of the ensonified area; (5) the absence of any other known areas or features of special significance for foraging or reproduction within the project area; and (6) the presumed efficacy of the planned mitigation measures in reducing the effects of the specified activity to the level of least practicable impact. In addition, none of these stocks are listed under the ESA or designated as depleted under the MMPA. In

combination, we believe that these factors, as well as the available body of evidence from other similar activities, including those conducted in nearby locations, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The specified activity is not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts. Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the planned monitoring and mitigation measures, we find that the total marine mammal take from Navy's pier construction activities will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers Analysis

The numbers of animals authorized to be taken for harbor porpoise, Northern elephant seal, and Steller and California sea lions would be considered small relative to the relevant stocks or populations (less than one percent for Northern elephant seal and California sea lion, less than four percent for Steller sea lion, and less than two percent for harbor porpoise) even if each estimated taking occurred to a new individual – an extremely unlikely scenario. For pinnipeds occurring in the nearshore areas, there will almost certainly be some overlap in individuals present day-to-day. Further, for the pinniped species, these takes could potentially occur only within some small portion of the overall regional stock. For example, of the estimated 296,750 California sea lions, only certain adult and subadult males – believed to number approximately 3,000-5,000 by Jeffries *et al.* (2000) – travel north during the non-breeding season. That number has

almost certainly increased with the population of California sea lions – the 2000 SAR for California sea lions reported an estimated population size of 204,000-214,000 animals – but likely remains a relatively small portion of the overall population.

For harbor seals, takes are likely to occur only within some portion of the population, rather than to animals from the Washington inland waters stock as a whole. It is estimated that, based on counts from the two nearby haul out sites, 160 harbor seals could potentially be in the vicinity to be exposed to the sound levels. This small number of individuals is expected to be the same animals exposed repeatedly, instead of new individuals being exposed each day. These animals, to which any incidental take would accrue, represent 1.5 percent of the most recent estimate of the stock abundance from the 2013 SAR. It is estimated that one individual harbor seal per day may be exposed to sound levels that may incur PTS. This represents only 0.68% of the stock abundance.

As summarized here, the estimated numbers of potential incidents of harassment for these species are likely much higher than will realistically occur. This is because (1) we use the maximum possible number of days (75) in estimating take, despite the fact that multiple delays and work stoppages are likely to result in a lower number of actual pile driving days; and (2) sea lion estimates rely on the averaged maximum daily abundances per month, rather than simply an overall average which would provide a much lower abundance figure. In addition, potential efficacy of mitigation measures in terms of reduction in numbers and/or intensity of incidents of take has not been quantified. Therefore, these estimated take numbers are likely to be overestimates of individuals. Based on the analysis contained herein of the likely effects of the specified

activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, we find that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, we have determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

No marine mammal species listed under the ESA are expected to be affected by these activities. Therefore, we have determined that a section 7 consultation under the ESA is not required.

National Environmental Policy Act

In compliance with the NEPA of 1969 (42 U.S.C. 4321 *et seq.*), as implemented by the regulations published by the Council on Environmental Quality (CEQ; 40 CFR parts 1500-1508), the Navy prepared an Environmental Assessment (EA) for this project. NMFS made the Navy's EA available to the public for review and comment, in relation to its suitability for adoption by NMFS in order to assess the impacts to the human environment of issuance of an IHA to the Navy. Also in compliance with NEPA and the CEQ regulations, as well as NOAA Administrative Order 216-6, NMFS has reviewed the

Navy's EA, determined it to be sufficient, and adopted that EA and signed a Finding of No Significant Impact (FONSI) in September 2016.

Authorization

As a result of these determinations, we have issued an IHA to the Navy for conducting the described pier and support facilities for the transit protection system U.S. Coast Guard Air Station/Sector Field Office Port Angeles, Washington from November 1, 2016 through February 15, 2017, and July 16 through October 31, 2017 provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: September 27, 2016.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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